APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

29. (Four Times Amended) A method of producing a solar cell comprising the steps of:

forming a porous layer in a surface region of a first substrate;

forming a first semiconductor layer on the porous layer by liquid phase epitaxy under a reducing atmosphere;

forming a second semiconductor layer on the first semiconductor layer by liquid phase epitaxy;

bonding the first substrate to a second substrate to obtain a multiple layer structure with the second semiconductor layer positioned inside; and

separating the first substrate from the multiple layer structure by utilizing the porous layer to transfer the first and second semiconductor layers to the second substrate;

wherein in the liquid phase epitaxy used to form the first semiconductor layer, a melting solution in which elements for forming the first semiconductor layer are dissolved up to a desired concentration, which is the same as or below saturated concentration, is brought into contact with a surface of the porous layer which is annealed under a reducing atmosphere in advance, while a surface temperature of the porous layer is made lower than a temperature at which elements in the melting solution having the desired concentration are saturated by at least 5 degrees Celsius.

57. (Twice Amended) A method of producing a semiconductor member comprising the steps of:

(a) forming a porous layer in a surface region of a first substrate;

(b-1) immersing, into a melting solution in which elements for forming a first semiconductor layer to be grown are dissolved up to a desired concentration, which is the same as or below saturated concentration, the porous layer, whose surface temperature is made lower than a temperature at which the melting solution having the desired concentration is saturated by at least 5 degrees Celsius, under a reducing atmosphere to grow the first semiconductor layer on a surface of the porous layer;

(b-2) forming a second semiconductor layer on the first semiconductor layer by liquid phase epitaxy;

(c) bonding a second substrate onto a surface side of the first substrate on which at least the porous layer and the first semiconductor layer are formed; and

(d) separating the first substrate from the second substrate at the porous layer to transfer the first and second semiconductor layers separated from the first substrate to the second substrate.

U.S. Patent No. 4,236,947 (Baliga). These claims have been cancelled without prejudice or disclaimer of subject matter, and without conceding the correctness of their rejection, strictly as an expedient to advance this case to allowance more quickly.

Claims 29, 57, 60, 61, 65 to 67, 88 and 102 to 110 were rejected under 35 U.S.C. § 103(a) over Kondo, Yonehara, Sakaguchi '748 or Sakaguchi '859 in view of Baliga. Claims 58 and 59 were rejected over the above references and further in view of U.S. Patent No. 4,774,194 (Hokuyou). Claims 94, 95 and 97 to 101 were rejected over the above references and further in view of U.S. Patent No. 5,391,257 (Sullivan). Reconsideration and withdrawal of these rejections are respectfully requested.

The present invention, as recited by amended Claim 29, concerns a method of producing a solar cell. A porous layer is formed in a surface region of a first substrate. A first semiconductor layer is formed on the porous layer by liquid phase epitaxy under a reducing atmosphere. A second semiconductor layer is formed on the first semiconductor layer by liquid phase epitaxy. The first substrate is bonded to a second substrate to obtain a multiple layer structure with the second semiconductor layer positioned inside. The first substrate is separated from the multiple layer structure by utilizing the porous layer to transfer the first and second semiconductor layers to the second substrate. In the liquid phase epitaxy used to form the first semiconductor layer, a melting solution in which elements for forming the first semiconductor layer are dissolved up to a desired concentration, which is the same as or below saturated concentration, is brought into contact with a surface of the porous layer while a surface temperature of the porous layer is made lower than a temperature at which elements in the melting solution having the

desired concentration are saturated by at least 5 degrees Celsius. The surface of the porous layer is annealed under a reducing atmosphere in advance.

The invention, as recited by amended Claim 57, concerns a method of producing a semiconductor member. A porous layer is formed in a surface region of a first substrate. The porous layer is immersed into a melting solution in which elements for forming a first semiconductor layer to be grown are dissolved up to a desired concentration, which is the same as or below saturated concentration, under a reducing atmosphere to grow the first semiconductor layer on a surface of the porous layer. The surface temperature of the porous layer is made lower than a temperature at which the melting solution is saturated by at least 5 degrees Celsius. A second semiconductor layer is formed on the first semiconductor layer by liquid phase epitaxy. A second substrate is bonded onto a surface side of the first substrate, and the first substrate is separated from the second substrate at the porous layer to transfer the first and second semiconductor layers from the first substrate to the second substrate.

Thus, according to one feature of the invention, the surface temperature of the porous layer is made lower than the temperature at which the melting solution is saturated by at least 5 degrees Celsius. By virtue of this feature, an easily-separable, high-crystalline semiconductor layer can be formed on a porous layer. See Experiment 3 and Table 2 of the specification.

The Office Action concedes that all of Kondo, Matsushita, Yonehara, Sakaguchi '748 and Sakaguchi '859 fail to disclose the foregoing feature, stating that these references do not teach the particulars of the LPE condition as claimed. Further, the Office

Action tacitly concedes that Baliga fails to disclose this feature, placing reliance on Baliga only for the feature of a reducing atmosphere.

In fact, the teaching of Baliga is seen to be directly opposite to the present invention, in which the surface temperature of the porous layer is made lower than the temperature at which the melting solution is saturated by at least 5 degrees Celsius.

In Baliga's first embodiment, the melt (31) is initially undersaturated, meaning that the temperature of the melt (31) is higher than its saturation temperature. See col. 2, line 53 of Baliga. Before the substrate wafer is introduced into the undersaturated melt (31), the temperature of the substrate wafer is brought up to the melt temperature. See col. 2, line 68 to col. 3, line 3 of Baliga. Since the substrate wafer temperature is made to be the same as the melt temperature, it is clear that the substrate wafer temperature, like the melt temperature, is higher than the saturation temperature of the melt.

In Baliga's second embodiment, the melt (31) is initially saturated, meaning that the temperature of the melt (31) is equal to its saturation temperature. See col. 3, line 52 of Baliga. Before the substrate wafer is introduced into the saturated melt (31), the substrate wafer is heated to a temperature higher than the temperature of the melt. See col. 3, lines 63 and 64 and col. 4, lines 1 and 2 of Baliga.

Thus, in each of Baliga's embodiments, the temperature of the wafer is made higher than the temperature at which the melting solution is saturated. This is in direct contrast to the present invention, in which the porous layer surface temperature is made lower than the temperature at which the melting solution is saturated by at least 5 degrees Celsius.

In the Response To Applicants' Arguments, the Office Action states that Baliga is relied upon for its broad teaching of liquid phase epitaxy in a pure tin melt either saturated or unsaturated with elements under a reduced atmosphere. Yet, the Office Action does not describe where Baliga, or any of the other applied references, teaches or suggests the feature of the porous layer surface temperature being made lower than the temperature at which the melting solution is saturated by at least 5 degrees.

In this regard, Applicants note that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. See MPEP § 2143.03.

Applicants therefore conclude that the applied references do not teach or suggest the claimed invention either singly or in the combination proposed by the Office Action, even assuming that such combination can properly be made. It is therefore respectfully requested that the Section 103 rejections be withdrawn.

No other matters being raised, it is believed that the entire application is fully in condition for allowance and such action is courteously solicited.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

Attorney for Applicants

Registration No. 52,310

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-2200
Facsimile: (212) 218-2200
CA_MAIN 55996 v 1